SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, JULY 12, 1901.

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

THE CARNEGIE TECHNICAL UNIVERSITY.

IT was some weeks ago announced by the daily press as definitely settled that Pittsburg is to have a great technical institution, especially adapted to its peculiar needs and to be made, in its industrial field, as complete and admirable as the Carnegie Institute of that city has become in art and æsthetics. Mr. Carnegie, who has now placed the Scotch universities in a comparatively comfortable position by an endowment of ten millions of dollars, and has thus contributed to the cause of liberal education more than has ever been before given by any individual in a single gift, has now determined to do something on a liberal scale for that department which most naturally appeals to his personal sympathies—education in applied sciences—and he has agreed to supply the funds for the new foundation. The organization of the institution has been entrusted to the local Board of Trustees, already having charge of the Carnegie Institute and the Carnegie Library at Pittsburg. This body has appointed a committee 'On Plan and Scope' and this committee, in turn, has called in experienced and expert advisers to aid them

in determining upon the very best plan and the most suitable scope of the institution, and of its curriculum.

These expert advisers were Dr. R. H. Thurston, Director of Sibley College, Cornell University, Professor J. B. Johnson, Dean of the College of Engineering, University of Wisconsin, Professor Thomas Gray of the Rose Polytechnic School and Professor V. C. Alderson of the Armour Institute. After their several reports had been made, they were organized into a committee to consider and report upon the schemes of the individual reports and to present a final and condensed statement of the plan upon which all could agree. This is the report which we present herewith to the readers of SCIENCE. It includes, as is seen, three different and distinct forms of school which may be combined as parts of one complete technical university that might satisfy the ambition of John Scott Russell, were that greatest of promoters of industrial education living; or they may be adopted, singly or together, on any scale which the needs of the city, the opportunities of the founder and the ambition of Mr. Carnegie and his coadjutors may seem to justify.

It is understood that this is simply a recommendation of his committees and that Mr. Carnegie is in no way bound to accept either the plan, the scope or the estimated endowment as binding upon him. It is understood that the committees will report to him the plan and scope proposed for these schools, leaving him free to found a school for artisans, a technical high school or a technical college, or, if his ambition mounts so high, a true *technical university*, including them all, and more complete and universally fruitful of good to all sorts and conditions of men and women—it is understood that both sexes are to be provided for—than has been any institution for technical, industrial and scientific education, ever before conceived. Even this latter is entirely within the means of Mr. Carnegie, as limited by his publicly declared plans of distribution of funds for educational purposes, and it would be a glorious thing for the world, as well as for Pittsburg and our country, could the ideal technical university be thus made a reality by our greatest philanthropist.

REPORT OF THE ADVISORY COMMITTEE ON THE CARNEGIE TECHNICAL SCHOOLS OF PITTSBURG.

PITTSBURG, PA., June 25, 1901.

Mr. William McConway, Chairman Committee on Plan and Scope.

DEAR SIR.—Your Advisory Committee begs leave to submit the following report upon the scope of the proposed Carnegie Schools of Technology.

INTRODUCTION.

It has become clear, both to educators and to business men, that the new century demands a wide dissemination of a *new type of school training*. The new methods of concentrated capital and of wholesale production; the ready means of transport by which our antipodes have become both our customers and our sources of supply; the practical abandonment of both the apprenticeship system and of the individual manufacturer; the world-wide field of operations in all lines of trade; the infinite number of applications of scientific knowledge in all fields of modern industry; the whole-world competition which confines success to the most economic production;

and the constant supplanting of manual labor and man power by automatic machinery and by steam or electric power; these are some of the signs of the times by which it is clear that some new kind of preparation for the work of life must be introduced into the school training of both boys and girls. This, too, not only for their individual success, but for the maintenance of American leadership in manufacturing and commerce. What this new education should be for America may be exemplified by the proposed Carnegie Technical Schools of Pittsburg. Nothing short of such a complete system should be planned.

The scheme which your committee proposes may be divided as follows:

I. The Carnegie Technical College.
II. The Carnegie Technical High School.
III. The Carnegie Artisan Day and Evening Classes.

I. THE CARNEGIE TECHNICAL COLLEGE.

This should be a first-grade technical college, superposed upon a high-school curriculum, with entrance requirements equal to those demanded by the best grade of existing colleges of engineering. It should be a school of both pure and applied science, and should prepare young men for leadership in the commercial as well as in the industrial pursuits. Both our manufacturing industries and our foreign commerce are now demanding the highest technical training it is possible to bestow, but this training must be fitted to particular vocations.

This college should be made attractive to the greatest scholars in the fields of physical and chemical science. To obtain and hold such men they must be given ample opportunities for research. This college must be supplied, therefore, not only with great experimental shops and laboratories for students' use, but in all departments there should be splendidly equipped laboratories of investigation and research, under the direction of the head of such department, and with a full corps of assistants for the carrying on of lines of investigation which are now partly or wholly unprovided for in America. These well-equipped workshops and these experimental and research laboratories would form the chief distinction of this technical college, and they would also be the chief item of expense. This college would support one or more publications in which the fruits of this research department would be given freely to the world. While the number of students in this college would be small, as compared with the number in the technical high school, the work done here would be of far more benefit to the world, and it would form the chief, if not the only, feature of the whole scheme to attract attention and to extend its beneficent influences beyond the immediate vicinity of Pittsburg.

Instruction in the Technical College should include:

1. Technical courses in—
   - *a.* Mechanical engineering.
   - *b.* Electrical engineering.
   - *c.* Civil engineering.
   - *d.* Chemical engineering.
   - *e.* Electro-chemical engineering.
   - *f.* Marine engineering.
   - *g.* Railway engineering.
   - *h.* Sanitary engineering.
   - *i.* Mining engineering and metallurgy.
   - *j.* Architecture.
   - *k.* Commerce and transportation.
2. Courses in pure and applied sciences.
   - *a.* Mathematics.
   - *b.* Physics.
   - *c.* Chemistry.
   - *d.* Biology.
   - *e.* Geology.
   - *f.* Mineralogy.
   - *g.* Astronomy.
   - *h.* Economics.
   - *i.* Commercial geography.
3. Courses in modern languages.
   - *a.* English.

b. German.
c. Spanish.
d. French.

II.—THE CARNEGIE TECHNICAL HIGH SCHOOL.

The work of this school should be superposed upon the work of the public grammar schools of Pittsburg and Allegheny. Its scope should be broad and comprehensive. The elective principle should be recognized, and graduation would depend not upon completing a prescribed curriculum, but upon completing a required number of courses, to be selected by the student under the direction of the director of the school.

In this school, the boy who wished to fit himself for industrial pursuits would find equal advantages with the boy who desired to prepare himself for professional engineering, or the girl who wished a general high school education supplemented by instruction in the home-making arts.

To make this instruction practical and fruitful of results it would be necessary to have well-equipped shops and experimental laboratories in all the courses leading toward specific employments, and these require a liberal housing, an expensive equipment and an expert direction by accomplished artisans. Such a complete school as is here proposed does not now exist in this country, but it would prove a pattern to be copied in every large city and such as the new century and the new industrial conditions demand.

Instructions should include:

1. The ordinary English high-school studies.
2. Physics, chemistry and biology, with students' laboratory practice.
3. The elements of the calculus and applied mechanics.
4. French, German and Spanish.
5. Commercial studies.
6. Domestic arts and sciences.
7. Freehand and mechanical drawing.
8. Technical studies, fitting for the industries of the locality, such as:

a. Blast furnace and foundry practice.
b. Glass-making.
c. Brass-founding and finishing.
d. Pattern-making and joinery.
e. Metal-working.
f. Stationary, locomotive and marine engine and boiler management.
g. Light and power station management.
h. Gas manufacture.
i. Railroad transportation.
j. Plumbing and domestic sanitation.
k. Surveying.
l. Clay working and ceramics.
m. Industrial art.

III.—THE CARNEGIE DAY AND EVENING CLASSES.

These classes are proposed for the benefit of those who are unable to take advantage of the more complete courses in the Technical High School. They should be available to both sexes. Instructions should include:

a. Elementary mathematics.
b. Elementary physics.
c. Elementary mechanics.
d. Elementary chemistry.
e. Freehand and mechanical drawing.
f. Modern languages and elementary instruction in such technical subjects as are taught in the Technical High School.
g. Courses of special lectures on subjects of interest to artisan classes.

In conclusion your committee desires to state that in its judgment a large tract of land, not less than 50 or 60 acres in extent, should be provided, in order that the buildings may be grouped about an attractive campus.

Furthermore, the best educational experience leads us to believe that the highest interests of these schools will be conserved by being maintained as independent insti-

tutions unhampered by public or private control.

Respectfully submitted,

(Signed) ROBERT H. THURSTON,
VICTOR C. ALDERSON,
THOMAS GRAY,
J. B. JOHNSON.

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*A NATIONAL UNIVERSITY.**

To the National Council of Education:

The undersigned members of the committee to investigate the entire subject of a national university and to report to the Council do now report, as follows:

The appointment of the committee was authorized by the Council at their meeting at Washington, D. C., on July 11, 1898, in the passage of the following resolution, offered by Mr. Dougherty, of Illinois:

Resolved, That the chair appoint a committee of fifteen, the majority of whom shall be members of the Council, who shall investigate the entire subject of the establishment of a national university and report to the Council.

MEMBERSHIP.

The president of the Council subsequently appointed the committee, as follows:

WILLIAM R. HARPER (*chairman*), president of the University of Chicago.

EDWIN A. ALDERMAN, president of the University of North Carolina (now president of Tulane University of Louisiana).

JAMES B. ANGELL, president of the University of Michigan.

NICHOLAS MURRAY BUTLER, professor of philosophy and education in Columbia University.

JAMES H. CANFIELD, president of Ohio State University (now librarian of Columbia University).

J. L. M. CURRY, agent of the Peabody and Slater educational funds.

NEWTON C. DOUGHERTY, superintendent of schools, Peoria, Ill.

ANDREW S. DRAPER, president of the University of Illinois.

CHARLES W. ELIOT, president of Harvard University.

EDMUND J. JAMES, professor of public administration in the University of Chicago.

WILLIAM H. MAXWELL, superintendent of schools, New York, N. Y.

BERNARD J. MOSES, professor of history and political economy in the University of California.

J. G. SCHURMAN, president of Cornell University.

F. LOUIS SOLDAN, superintendent of schools, St. Louis, Mo.

WILLIAM L. WILSON, president of Washington and Lee University.

MEETINGS.

The committee have held three protracted meetings: at Washington, D. C., on November 2, 3 and 4, 1899; at Chicago, Ill., on February 26, 27 and 28, 1900; and at New York, N. Y., on May 23 and 24, 1901. The first meeting of the committee was attended by all the members except Messrs. Angell, James (absent in Europe), and Moses. The second meeting was attended by Messrs. Harper, Alderman, Butler, Dougherty, Draper, Eliot and Soldan. The third meeting was attended by Messrs. Harper, Butler, Canfield, Dougherty, Draper, Eliot and Maxwell.

Mr. Moses has been absent from the country on public business, and so has been prevented from sharing in any of the deliberations of the committee. Mr. Wilson's untimely death in 1900 deprived the committee of the benefit of his cooperation in the preparation of this report.

PRELIMINARY INQUIRIES.

Before the committee came together for the first time, individual members had, at the request of the chairman, undertaken to prepare reports upon special phases of the subject referred to the committee, with a view to preparing the way for their more intelligent consideration and discussion. The reports so prepared included one by Mr. James, on the constitutionality of a national university (printed in the *Educational Review*, Vol. XVIII., pp. 451–66, December, 1899); one by Mr. Canfield, on past efforts to establish a national university and the reasons for their failure; two

*Report of the Committee of the National Educational Association.